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AUSTRALIAN CARABID BEETLES XIII. FURTHER NOTES ON AGONINI, AND A GENUS OF LICININI NEW TO AUSTRALIA

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Since publication of my "Notes on the [Australian] Agonini" (1956) I have spent nineteen months in Australia (Dec. 1956-June 1958), mostly collecting in the eastern forested areas. My itinerary, with list of localities, is summarized in a recent paper (1961). The following additional notes on Agonini are based on material secured during this trip and borrowed from the Queensland Museum, and on examination of some of Sloane's types. The most exciting new discovery is an Australian species of the Indian genus *Dilonchus*, which is a licinine rather than an agonine but which is in some ways suitable to be ancestral to the supposedly agonine genus *Homothus*. The finding of dimorphism of "fixed" setae in *Notagonum macleayi* (Sloane) is noteworthy too.

Tribe AGONINI

Before considering the Agonini proper, I have to say that one supposed Australian agonine does not belong in this tribe. It is:

COPTOGLOSSUS CARTERI (Sloane) (new combination)

Platynus carteri Sloane 1915, p. 460.

The type of this species, from Dorrigo, New South Wales, is in the Sloane Collection at Canberra. I have compared one of my specimens with it. It is a broad, depressed, dull black carab that looks superficially as if it might be either an agonine or a lebiine. The elytra are broadly rounded apically, not obliquely

truncate as usual in Lebiini, but this is not an invariable tribal character. Two other characters show that the insect is a lebiine and that Sloane was wrong in assigning it to the Agonini ("Sphodrini"). One character is that the middle tibiae are sparsely pubescent rather than spinose externally. The other is that the basal bulb of the aedeagus is small and not much bent down, not large and strongly curved as in the Agonini. "*Platynus*" *carteri* Sloane should therefore be transferred to the tribe Lebiini, where it can be placed tentatively in the genus *Coproglossus*.

NOTAGONUM Darlington

Darlington 1952, p. 127.

In my recent collecting I found 4 species assignable to *Notagonum* in tropical North Queensland. However, this is a genus of convenience, and I am not sure that these species are all related to each other. They may represent 4 independent stocks, so far as the Australian fauna is concerned. The 4 species are distinguished in the key and briefly discussed thereafter. In addition, the following agonines were found in North Queensland: *Lorostemma* ("*Platynus*") *cooki* (Sloane), distinguished from *Notagonum* by sole of hind tarsus with a single, regular row of bristles on each side; *Dicranoneus queenslandicus* (Sloane), a slender brown agonine with toothed tarsal claws; *Violagonum* ("*Colpodes*") *violaceum* (Chaudoir), a blue or purple species with spined elytra; *Colpodes habilis* Sloane, larger, with bright green elytra; the well known *Homothus*; and *Odontagonum*, a convex, shining black, flightless agonine with dentate humeri.

Key to Species of NOTAGONUM of North Queensland

1. Slender; head more than .75 width prothorax; 4th segment hind tarsus broadly emarginate (Fig. 5); (length c. 9.5 mm.) *submetallicum*
- Less slender; head less than .75 width prothorax; 4th segment hind tarsus narrower, usually more lobed 2
2. Larger (9-10 mm); aeneous, elytral striae shallow, intervals flat *lafertei*
- Smaller (6-8 mm.); brown, sometimes slightly iridescent, but not aeneous; elytral striae deeper, intervals slightly convex 3
3. Apex of elytron not subtruncate, usually not distinctly denticulate (Fig. 9); 4th segment hind tarsus wider apically, with angle between lobes c. right (Fig. 4). *macleayi*

- Apex of elytron subtruncate, usually denticulate (Fig. 10); 4th segment hind tarsus oval, strongly narrowed apically, with angle between lobes acute (Fig. 3) *dentellum*

NOTAGONUM SUBMETALLICUM (White) (new combination)

Colpodes submetallicus White 1846, p. 2.

This is a very common species in south temperate Australia and Tasmania, and it occurs also in New Zealand. It lives in a variety of situations on the ground by water. It is apparently rare in tropical Australia but does occur there. I found 2 specimens by tramping down tall grass and thick herbage growing in sluggishly flowing water in open country near Atherton, North Queensland, in February, 1958. This is an example of a phenomenon which is probably zoogeographically significant: penetration of the tropics by a temperate carabid associated with water. Some other, north temperate Carabidae seem to have crossed the whole width of the tropics in waterside habitats. I have recently given examples in *Bembidion* and the Trechini (1959, esp. pp. 332, 342).

NOTAGONUM LAFERTEI (Montrouzier) (new combination)

Anchomenus lafertei Montrouzier 1860, p. 238.

Although *lafertei* has been placed in *Colpodes*, the 4th hind tarsal segment is only weakly lobed (Fig. 6). I tentatively assign the species to *Notagonum* because of absence of any obvious distinguishing characters. *N. lafertei* is common from the vicinity of Cooktown south through Queensland and part of New South Wales. I did not find it on the Cape York Peninsula north of Cooktown and it is unknown in New Guinea, but it occurs on New Caledonia. It is frequently found with the two following species in debris and among dead leaves on the ground by water, but it often occurs also away from water and in more arboreal habitats, especially in clumps of wilted leaves on fallen trees in rain forest.

NOTAGONUM MACLEAYI (Sloane) (new combination)

Platynus macleayi Sloane 1910, p. 454.

Sloane described *macleayi* from Kuranda, North Queensland. The type in the Sloane Collection is now reduced to one elytron

which, however, is identifiable. I have topotypes, one of which matches the type elytron almost exactly. (The form of the elytral apex is somewhat variable in both this and the following species but does serve to identify most individuals satisfactorily.)

This species is unknown in New Guinea and I did not find it near the tip of Cape York, but it occurs from the mid-peninsular forests (Iron Range, Rocky Scrub, etc.) south to the Atherton Tableland and the Kirrama Range, which is west of Cardwell. It lives beside brooks and rivers, often in masses of drift caught on obstructions above the water or in accumulations of dead leaves deposited on stream banks at bends or beside pools.

N. macleayi proves to be dimorphic in presence or absence of anterior lateral prothoracic and anterior discal elytral setae (Figs. 1, 1A). These particular setae are apparently inherited as a group: all 4 of them are present or all absent in most individuals. This dimorphism is presumably due to a single mutation inherited in Mendelian fashion. The only possible exception to strict dimorphism is a female from Shipton's Flat which lacks the setae in question except for an apparent trace of the anterior discal elytral puncture on the right elytron only. With this exception, my 48 specimens of the species divide as follows.

<i>Locality</i>	<i>With designated setae</i>	<i>Without designated setae</i>
Tozer Gap (W. of Iron Range)	3 ♀ ♀	1 ♀
Iron Range	16 ♂ ♂, 12 ♀ ♀	
Rocky River	3 ♂ ♂	
Shipton's Flat (S. of Cooktown)	1 ♂	3 ♀ ♀
Kuranda	2 ♂ ♂	2 ♂ ♂, 3 ♀ ♀
Kirrama Range	1 ♂	

These figures suggest that the population of *macleayi* in the base-of-peninsular forests (from the Atherton Tableland to near Cooktown, tabulated below the broken line) includes a considerable proportion of individuals without the setae in question, but that the population in the mid-peninsular forests of the Cape York peninsula (tabulated above the broken line) includes only an occasional individual that has lost setae.

In my paper on New Guinean Agonini (1952, pp. 89-252) I used presence or absence of the anterior lateral prothoracic setae

as a character to help distinguish genera, especially to distinguish the two "genera of convenience" *Notagonum* and *Allagonum*. However, I made it clear in that paper (bottom of p. 97) that the character was only a useful "tag" and not a character of generic value in itself. The setae in question are not known to vary in any species of agonine in New Guinea, and they do provide useful tags for dividing the New Guinean species into convenient groups.

NOTAGONUM DENTELLUM Darlington

Darlington 1952, p. 147.

In New Guinea, this species is common, widely distributed, and somewhat variable. In Australia, it occurs from the tip of the Cape York Peninsula (Lockerbie and Bamaga) south to the Atherton Tableland and the Kirrama Range. It lives in about the same situations as the preceding species.

COLPODES HABILIS Sloane

Sloane 1907, pp. 178, 179.

Darlington 1952, p. 164.

Colpodes habilis is black with green elytra and is 13-17 mm. long (in New Guinea). It has a wide range in the eastern Malay Archipelago, including Buru, New Guinea, New Britain, the Solomons, and the Santa Cruz Islands. It has not previously been reported from Australia, but I have seen specimens from Cairns District, Coen, and Port Douglas (near Mossman) (all in the Queensland Museum), and an individual flew into the lighted window of a house where I was staying in Cairns in February, 1958. The species' usual habitat (in New Guinea) is in foliage, including clumps of wilted leaves on fallen trees in rain forest.

ODONTAGONUM NIGRUM Darlington

Darlington 1956, p. 9.

This flightless species is the type of a very distinct monotypic genus of unknown relationships. It was described from three individuals from Millaa Millaa and Lake Barrine, on the Atherton Tableland, North Queensland. It proves to be fairly widely distributed on the Tableland but apparently does not reach either the Dividing Range west of Atherton or the vicinity of Kuranda, although apparently suitable rain forests exist in both these places. It lives on the ground in rain forest.

Tribe LICININI

DILONCHUS Andrewes

Andrewes 1936, p. 179.

This genus was proposed for one medium sized *Agonum*-like species from India. The Australian species described below seems congeneric. It combines characters of the tribe Licinini with color pattern suggesting *Homothec*. Generic characters are included in the following specific description, and the place of the genus among other Australian Licinini is discussed after the description.

DILONCHIUS PICTUS n. sp.

Form (Fig. 2) like *Agonum* but with elytra more ample; color black; reflexed margins of prothorax testaceous; elytra with humeri, epipleuri, and outer margins testaceous, the pale color extending to the 9th intervals anteriorly and forming separated spots on these intervals posteriorly; a small testaceous spot at each dorsal seta; lower surface testaceous with episterna more or less darker; femora pale, tibiae, tarsi, antennae, and palpi browner; upper surface rather dull, with close reticulate micro-sculpture isodiametric on head and pronotum and slightly transverse on elytra.

Head short, .66 & .64 width prothorax (from measurement of ♂ type and ♀ paratype); mandibles slightly sinuate externally, then abruptly curved and bent down toward apex, each with very large triangular inner tooth and short terebra; eyes large and prominent; 2 supra-ocular setae each side; antennae slender, pubescent from near base 4th segment, with segment 1 c. 5 X long as wide, segments 3 and 4 slightly shorter and subequal, segment 2 much shorter; maxillary palpi with last segment somewhat thickened, labial palpi with last segment subsecuriform in both sexes (wider than in *bidens*); clypeus truncate or nearly so; labrum moderately emarginate, 4-setose; front nearly evenly convex, with neck impression and frontal impressions weak, clypeal suture finely impressed; mentum joining gula without distinct intervening sclerites, broadly emarginate, without tooth.

Prothorax: width/length 1.29 & 1.33; base/apex 1.39 & 1.41; base/head 1.31 & 1.33; apex broadly emarginate; anterior angles not otherwise advanced, moderately rounded; base very broadly

arcuate, almost truncate at middle; sides broadly rounded anteriorly, slightly so posteriorly, slightly sinuate before posterior angles; latter slightly obtuse, slightly blunted; lateral margins rather wide, moderately reflexed, each with usual 2 setae about $1/3$ from apex and at basal angle; disc moderately convex, depressed at sides, margined at base and apex; median line distinct, apical and basal transverse impressions weak; surface faintly sparsely transversely wrinkled at middle, more strongly longitudinally so at apex and base; basal foveae broad, not well defined, impunctate or nearly so. *Elytra* long-oval, about $2/3$ wider than prothorax ($E/P = 1.64$); anterior margin entire, humeral margins vaguely angulate, lateral margins slightly sinuate before apex but not interrupted, apices simple; scutellar striae well developed; striae entire, impunctate; intervals nearly flat, not specially modified; no 10th interval; 3rd interval 2-punctate near 2nd stria behind basal $1/3$ and near apical $1/3$. Inner wings fully developed. Legs slender; tibiae spinescent; hind tibiae not specially grooved externally; hind tarsi with first 3 segments finely grooved each side above, 4th segment shallowly emarginate but not lobed, 5th segment with conspicuous accessory setae; claws simple; sole of hind tarsus with a single regular row of setae each side. Secondary sexual characters: ♂ with first 3 segments each front tarsus dilated, squamulose below, the squamae small and forming 4 longitudinal rows; ♂ with apparently only 1, ♀ with 4 or 5 (asymmetrical) setae near apex each side last ventral segment. Length *c.* 7.5-8.0; width *c.* 3.1-3.3 mm.

Holotype ♂ (M. C. Z. Type No. 30,394) from Longlands Gap, Atherton Tableland, North Queensland, about 3000 ft. altitude, Feb. 1958; and 1 ♀ paratype from Kirrama Range, W. of Cardwell, North Queensland, about 2000 ft. altitude, Dec. 1957. Both specimens taken by myself in accumulations of dead leaves on the ground under the heads of small fallen trees in partly felled rain forest. The ♂ type is teneral and warped, so that width of elytra cannot be measured and the genitalia cannot be dissected.

This species runs to *Microferonia* in Sloane's (1898, p. 488) key to Australian genera of Liciniini but has a more *Agonum*-like form, simpler clypeus (almost truncate, with only a narrow transverse membrane anteriorly), longer and less emarginate labrum, more distinct subapical sinuations of elytra, longer scutellar striae (these are characters of *Dilonchus*), and different color pattern. As compared with the genotype of *Dilonchus* (*bidens*

Andrewes, of which I have a cotype), the new Australian species has a relatively narrower prothorax with better defined posterior angles, more distinct elytral microsculpture, wider last segment of labial palpi, and more extensive elytral markings. However *bidens* has indications of the same pattern of markings, especially laterally, that *pictus* has. (Two apparent errors in Andrewes' description of *bidens* should be noted. The insect is not apterous. My "cotype" has fully developed inner wings. And the clypeus is probably not emarginate. It seems squarely truncate in front but semicircularly impressed, and the impressed area is pale and easily mistaken for an emargination — but dissection would be necessary to make sure of this detail.)

The rather *Agonum*-like form, untoothed mentum, and *Homothes*-like color pattern (and habitat) together suggest that the present new species may represent the ancestral stock of *Homothes*. If so, *Homothes* has lost some of the specializations (of mouth parts) that characterize most Licinini, while developing other specializations of its own, some of which suggest agonine rather than licinine affinities. To determine the inter-relationship (if any) and probable evolution of *Dilonehus* and *Homothes* would require both more material and more time than I now have.

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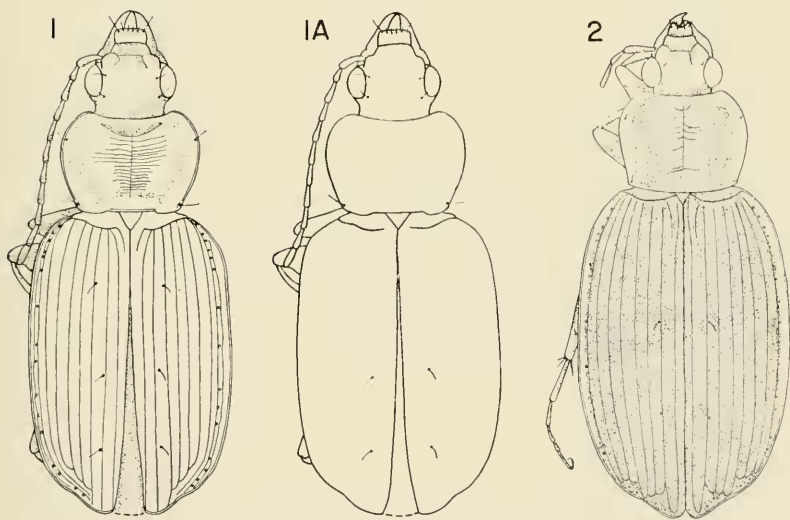


Fig. 1. *Notagonum macleayi* (Sl.), with full complement of setae.

Fig. 1A. Same, outline with anterior lateral pronotal and anterior discal elytral setae absent.

Fig. 2. *Dilonchus pictus* n. sp.

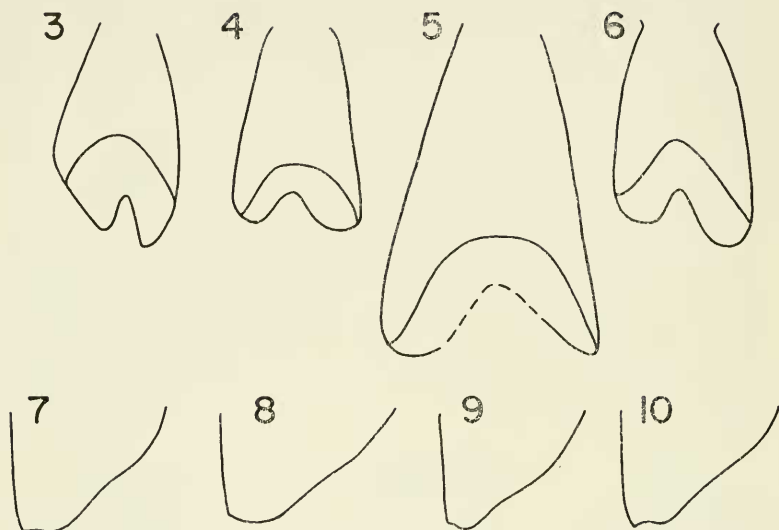


Fig. 3. Fourth segment right hind tarsus, outline from above with setae omitted, of *Notagonum dentellum* Darl.

Fig. 4. Same of *Notagonum macleayi* (Sl.).

Fig. 5. Same of *Notagonum submetallicum* (White).

Fig. 6. Same of *Notagonum lafertei* (Montr.).

Fig. 7. Apex right elytron of *Notagonum submetallicum* (White).

Fig. 8. Same of *Notagonum lafertei* (Montr.).

Fig. 9. Same of *Notagonum macleayi* (Sl.).

Fig. 10. Same of *Notagonum dentellum* Darl.